

Application/Control Number: 09/870,531

Art Unit: 0

CLMPTO

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**Claim 1 (currently amended): A method for fabricating a silicon based package (SBP) in the sequence as follows:**

**starting with a wafer composed of silicon and having a first surface and a reverse surface which are planar as the base for the SBP,**

**then forming an interconnection structure including multilayer conductor patterns over the first surface; [[,]]**

**then forming a protective overcoat layer over the interconnection structure; [[, and]]**

**then forming a temporary bond between the protective overcoat layer of the SBP and a wafer holder, with the wafer holder being a rigid structure; [[,]]**

**then thinning the reverse surface of the wafer to a desired thickness to form an ultra thin silicon wafer (UTSW) for the SBP; [[,]]**

**then forming via holes which extend through the UTSW; [[,]]**

**then forming metallization in the via holes with the metallization extending through the UTSW; and**

**then remove removing the temporary bond.**

**Claim 2 (previously presented): The method of claim 1 including bonding the metallization in the via holes to pads of a carrier.**

**Claim 3 (previously presented): The method of claim 1 including forming capture pads on the first surface prior to thinning the wafer.**

**Claim 4 (currently amended): The method of claim 1 including:**

**initially forming capture pads on the first surface; [[,]]**

**then forming the interconnection structure over the first surface and the capture pads; [[,]]**

**then forming the temporary bond of the wafer holder to the reverse surface; [[,]] and**

**then thinning the wafer, thereby forming the UTSW.**

**Claim 5 (currently amended): The method of claim 1 including:**

**initially forming capture pads on the first surface; [[,]]**

**then forming interconnection structure over the first surface and the capture pads; [[,]]**

**then forming the temporary bond of the wafer holder to the reverse surface,**

**then thinning the wafer, thereby forming the UTSW; [[,]] and**

**then forming the via holes through the UTSW down to the capture pads.**

**Claim 6 (currently amended): The method of claim 1 including:**

**initially forming capture pads on the first surface; [[,]]**

**then forming interconnection structure over the first surface and the capture pads,**

**then forming the temporary bond of the wafer holder to the reverse surface,**

**then thinning the wafer, thereby forming the UTSW; [[,]]**

**then forming the via holes through the UTSW down to the capture pads; [[,]]**

**then forming a dielectric layer over the surface of the wafer leaving the bottoms of the via holes clear with the capture pads exposed; [[,]] and**

**then forming the metallization in the via holes in contact with the capture pads.**

**Claim 7 (currently amended): The method of claim 1 including:**

**initially forming capture pads on the first surface; [[,]]**

**then forming interconnection structure over the first surface and the capture pads**

**then forming the temporary bond of the wafer holder to the reverse surface; [[,]]**

**then thinning the wafer, thereby forming the UTSW; [[,]]**

**then forming the via holes through the UTSW down to the capture pads; [[,]]**

**then forming a dielectric layer over the surface of the wafer leaving the bottoms of the via holes clear with the capture pads exposed; [[,]]**

**then depositing metal pads into the via holes in contact with the capture pads; [[,]]**

**and**

**then [[form]] forming metal joining structures on the metal pads.**

**Claim 8 (previously presented): The method of claim 1 including initially forming via holes in the first surface prior to thinning the wafer.**

**Claim 9 (currently amended): The method of claim 1 including the steps as follows:**

**initially forming via holes in the first surface prior to thinning the wafer ; [[,]]**

**then forming a dielectric layer covering the via holes.**

**Claim 10 (currently amended): The method of claim 1 including the steps as follows:**

**initially forming via holes in the first surface prior to thinning the wafer; [[,]]**

**then forming a dielectric layer over the surface of the wafer including the via holes;**

**[[,]] and**

**then forming a through via/cap pad layer of a first metal layer over dielectric layer including the via holes.**

**Claim 11 (currently amended): The method of claim 1 including the steps as follows:**

**initially forming via holes in the first surface prior to thinning the wafer; [(),]**  
**then forming a dielectric layer over the surface of the wafer including the via holes,**  
**then forming a through via/cap pad layer of a first metal layer over dielectric layer**  
**including the via holes; [(),] and**  
**then planarizing to remove the via/cap pad layer above the surface of the dielectric**  
**layer, thereby forming vias in the via holes.**

**Claim 12 (currently amended): The method of claim 1 including the steps as follows:**

**initially forming via holes in the first surface prior to thinning the wafer; [(),]**  
**then forming a dielectric layer over the surface of the wafer including the via holes,**  
**then forming a through via/cap pad layer of a first metal layer over dielectric layer**  
**including the via holes; [(),]**  
**then planarizing to remove the via/cap pad layer above the surface of the dielectric**  
**layer, thereby forming vias in the via holes; [(),] and**  
**then forming an interconnection structure over the first surface including the first**  
**metal layer.**

**Claim 13 (currently amended): The method of claim 1 including the steps as follows:**

**initially forming via holes in the first surface prior to thinning the wafer; [(),]**  
**then forming a dielectric layer over the surface of the wafer including the via holes,**  
**then forming a through via/cap pad layer of a first metal layer over dielectric layer**  
**including the via holes; [(),]**  
**then planarizing to remove the via/cap pad layer above the surface of the dielectric**  
**layer, thereby forming vias in the via holes ; [(),and]]**  
**then forming interconnection structure over the first surface including the metal vias**  
**and the first metal layer; [(),]**  
**then forming the temporary bond to the rigid wafer holder on the reverse surface;**  
**[(),] and**  
**then thinning the wafer to the desired thickness of the UTSW.**

CLAIMS 14-24. (CANCELLED)

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**Claim 25 (currently amended): A method for fabricating a Silicon Based Package (SBP) in the sequence as follows:**

**starting with a wafer composed of silicon and having a first surface and a reverse surface which are planar as the base for the SBP; [[,]]**

**then forming an interconnection structure including multilayer conductor patterns over the first surface; [[,]]**

**then forming a protective overcoat layer composed of polyimide over the interconnection structure; [[,]]**

**then forming a temporary bond between the protective overcoat layer of the SBP and a wafer holder, with the wafer holder being a rigid structure; [[,]]**

**then thinning the reverse surface of the wafer to a desired thickness to form an Ultra Thin Silicon Wafer (UTSW) for the SBP; [[,]]**

**then forming via holes which extend through the UTSW; [[,]]**

**then forming metallization in the via holes with the metallization extending through the UTSW; [[,]] and**

**then removing the temporary bond.**

**Claim 26 (currently amended): The method of claim 25 including:**

**forming the temporary bond with polyimide; [[,]], and**

**releasing the temporary bond by laser ablation.**

CLAIM 27. (CANCELLED)

CLAIMS 28-29. (CANCELLED)

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Claim 30 (currently amended): The method of claim 1 ~~[[29]]~~ including the UTSW having a desired thickness including the steps performed in the sequence as follows:

~~performing a step of forming an interconnection structure including multilayer conductor patterns over the first surface of the silicon wafer;~~  
then forming a protective overcoat layer over the interconnection structure;  
[[then]] the step of forming the temporary bond between the protective overcoat layer of the SBP and the wafer holder leaving the reverse surface exposed;  
~~then thinning the reverse surface of the wafer to a desired thickness to form the UTSW for the SBP;~~  
then forming the via holes which extend extending through the thickness of the UTSW; and  
then forming the metallization in the via holes ~~with the metallization~~ extending through the thickness of the UTSW. ~~[[; and]]~~  
~~thereafter releasing the temporary bond.~~

CLAIM 31. (CANCELLED)